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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,887	11/21/2003	Keiji Yada	B-5308 621524-7	1431

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EXAMINER	
KAO, CHIH CHENG G	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 10/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/719,887	YADA ET AL.	
	Examiner	Art Unit	
	Chih-Cheng Glen Kao	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 11* is/are rejected.

7)☒ Claim(s) *6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 November 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/27/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 1-6 and 11 are objected to because of the following informalities, which appear to be minor draft errors including grammatical and lack of antecedent basis problems.

In the following format (location of objection; suggestion for correction), the following corrections may obviate their respective objections: (claim 1, line 9, "chamber, an anode and"; inserting a comma after "anode"), (claim 1, line 26; indenting the paragraph starting with "reflected electron detecting means"), (claim 1, last line, "the electron image"; replacing "the" with - -an- -), (claim 2, line 15, "chamber, an anode and"; inserting a comma after "anode"), (claim 2, lines 17-18, "said electrons; and said"; deleting "and"), (claim 2, lines 29-30, "said electric field, a scan coil"; inserting - -and- - after the comma), (claim 3, line 15, "chamber, an anode and"; inserting a comma after "anode"), (claim 3, lines 17-18, "said electrons; and said"; deleting "and"), (claim 3, lines 29-30, "said electric field, an electron beam axis"; inserting - - and- - after the comma), (claim 4, line 15, "chamber, an anode and"; inserting a comma after "anode"), (claim 5, line 15, "chamber, an anode and"; inserting a comma after "anode"), (claim 6, line 9, "chamber, an anode and"; inserting a comma after "anode"), (claim 6, line 37, "said X-ray generating target"; replacing "X-ray generating target" with - -target for X-ray generation- -), (claim 6, line 40, "the current"; replacing "the" with - -a- -), (claim 6, lines 44-45, "said electron image"; replacing "said" with - -a- -), and (claim 11, line 2, "comprises of a"; deleting "of").

For purposes of examination, the claims have been treated as such. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 5 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "longer" in claim 5, line 34, is a relative term, which renders the claim indefinite. The term "longer" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Therefore, the working distance has been rendered indefinite.

The term "several" in claim 5, line 34, also renders the claim indefinite, since the specification does not provide a standard for ascertaining the requisite degree. Therefore, the quantity of "centimeters" has been rendered indefinite.

Claim 11 has been rejected by virtue of its dependency.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 5044001) in view of Delong et al. ("A new design of field emission electron gun with a magnetic lens"), Saito et al. (US 5041732), and Ishitani et al. (US 2003/0039386).

Wang discloses an apparatus comprising an electron gun having an ultra-high vacuum electron gun chamber (fig. 2, as evidenced by #8), an anode (fig. 2, #4), and an electron generating portion (fig. 2, #3), wherein the electron generating portion is adapted to generate electrons (fig. 2, #9) and said anode is necessarily adapted to generate an electric field to accelerate said electrons (col. 8, lines 38-42), said electron gun further comprising a magnetic superposition lens (fig. 2, #6) including a magnetic circuit (fig. 7, coil) and a magnetic field generating portion (fig. 7, portions surrounding the coil), wherein said magnetic superposition lens is necessarily adapted to generate a focusing lens magnetic field having a center (fig. 2, as evidenced by the shape of #9 in the center of #6), and a scan coil (fig. 2, #29) for freely swinging an electron probe, formed via said magnetic superposition lens (fig. 2, #6), on a surface of a target for X-ray generation (fig. 2, #12).

However, Wang fails to disclose a field emission electron gun, wherein a magnetic field generating portion is disposed separately from an ultra-high vacuum electron gun chamber, wherein said magnetic field generating portion is disposed outside of said ultra-high vacuum electron gun chamber, wherein an electron source of an electron generating portion is disposed substantially in a center of a focusing lens magnetic field and said focusing lens magnetic field is superposed to an electric field thereby reducing a lens aberration of a magnetic superposition lens and reducing a loss amount of electrons from said electron source by focusing said electrons being accelerated by said electric field, reflected electron detecting means having a detecting

portion disposed about a target for detecting a reflected electron from said target, and electron image generating means for performing imaging of a target surface utilizing signals from said reflected electron detecting means, wherein the apparatus is provided for allowing alignment operations including focus adjustment to said target and astigmatism correction to be performed on a basis of image information from an electron image.

Delong et al. teaches a field emission electron gun (title), wherein a magnetic field generating portion is disposed separately from an ultra-high vacuum electron gun chamber, and wherein said magnetic field generating portion is disposed outside of said ultra-high vacuum electron gun chamber (abstract). Saito et al. teaches wherein an electron source of an electron generating portion (fig. 3, #3) is disposed substantially in a center of a focusing lens magnetic field (fig. 3, field of #6) and said focusing lens magnetic field is superposed to an electric field (fig. 3, created between #3 and 14a) thereby reducing a lens aberration of a magnetic superposition lens (col. 1, lines 48-58) and reducing a loss amount of electrons from said electron source by focusing said electrons being accelerated by said electric field (col. 3, lines 14-25). Ishitani et al. teaches reflected electron detecting means having a detecting portion (fig. 1, #6) disposed about a target (fig. 1, #4) for detecting a reflected electron (fig. 1, #5) from said target, and electron image generating means for performing imaging of a target surface utilizing signals from said reflected electron detecting means (paragraph 17), wherein the apparatus is provided for allowing alignment operations including focus adjustment to said target and astigmatism correction to be performed on a basis of image information from an electron image (paragraphs 66 and 67).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to include the apparatus of Wang with the gun and outside magnetic field generating portion of Delong et al., since one would have been motivated to make such a modification for higher emissions and for simplifying cooling arrangements (abstract, last line) as shown by Delong et al.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to include the apparatus of Wang with the arrangement of the gun and magnetic field of Saito et al., since one would have been motivated to make such a modification for enhancing brightness (col. 1, lines 48-58) and directing most of the emissions (col. 3, lines 21-25) as shown by Saito et al. to reduce losses.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to include the apparatus of Wang with the imaging for correcting of Ishitani et al., since one would have been motivated to make such a modification for obtaining better resolution (paragraph 1) as implied from Ishitani et al.

Also note that recitations (i.e., "wherein the apparatus is provided for allowing alignment operations including focus adjustment to said target for X-ray generation and astigmatism correction to be performed on a basis of image information from an electron image") with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from prior art if the prior art teaches all the structural limitations of the claim. See MPEP 2114.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Delong et al., Saito et al., and Wada (US 5319198).

Wang in view of Delong et al. and Saito et al. suggests an apparatus as recited above.

However, Wang fails to disclose an electron beam axis alignment coil disposed in an upstream side of an anode and disposed close to an electron source, for aligning an axis of said electron beam while accelerating the electron beam.

Wada teaches an electron beam axis alignment coil (fig. 1, #220) disposed in an upstream side of an anode (fig. 1, #213) and disposed close to an electron source (fig. 1, #211), for aligning an axis of said electron beam (col. 1, lines 17-19) while accelerating the electron beam (fig. 1, via #213).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to include the apparatus of Wang as modified above with the electron beam axis alignment coil of Wada, since one would have been motivated to make such a modification for deterring the divergence of electrons, which would lower the intensity of radiation and signals derived from the object.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Delong et al., Saito et al., and Baker et al. (US 5081656).

Wang in view of Delong et al. and Saito et al. suggests an apparatus as recited above.

However, Wang fails to disclose electron probe control means for controlling circular scanning of an electron beam on a target by deflecting the electron beam, and X-ray CT image generating means for allowing a microstructure of a cross section of interest of an object to be

displayed by processing plural sets of images based on data of transmitted X-rays of said object in response to said scanning.

Baker et al. teaches electron probe control means (fig. 3a, #281) for controlling circular scanning (fig. 5) of an electron beam (fig. 3a, #285) on a target (fig. 3a, #287) by deflecting the electron beam, and X-ray CT (col. 1, lines 8-12) image generating means (fig. 3a, #258, 270, and 272) for allowing a microstructure of a cross section of interest of an object (fig. 2a) to be displayed (fig. 3c, #294) by processing plural sets of images based on data of transmitted X-rays of said object in response to said scanning (abstract).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to include the apparatus of Wang as modified above with the image generating means of Baker et al., since one would have been motivated to make such a modification for rapid, high resolution inspection (col. 1, lines 9-12) as shown by Baker et al.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Delong et al., Saito et al., and Ferrandino et al. (US 2002/0057759).

Wang et al. in view of Delong et al. and Saito et al. suggests an apparatus as recited above. Wang further discloses fluorescent X-ray detecting means having a detecting portion (fig. 1, #17 and 18, and col. 8, lines 67-68) disposed in space about an objective lens (fig. 2, #7) and said object (fig. 1, #14, and col. 8, lines 61-62) and outside a region of a generation of said X-rays (fig. 1, #12) for detecting a fluorescent X-ray generated from said object, wherein said objective lens has a long focal distance and a longer working distance (fig. 2, distance of #9 from #7 to 12), and elemental analysis means for analyzing elements of said object based on

fluorescent X-ray signals from said fluorescent X-ray detecting means (col. 7, line 52, to col. 8, line 6).

However, Wang fails to disclose fluorescent X-ray detecting means having a detecting portion in a space above an object, a working distance of several centimeters, and a pin hole, wherein said pin hole is located between a target and an object.

Ferrandino et al. teaches fluorescent X-ray detecting means having a detecting portion (fig. 1, #107) in a space above an object (fig. 1, #115), and a pin hole, wherein said pin hole is located between a target and an object (col. 1, lines 28-36).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to include the apparatus of Wang as modified above with the arrangement of the fluorescent X-ray detecting means of Ferrandino et al., since rearranging parts of an invention involves only routine skill in the art. One would have been motivated to make such a modification for reducing components in the path of the fluorescent X-rays to the detector in order to obtain a better signal.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to include the apparatus of Wang as modified above with the pin hole arrangement of Ferrandino et al., since one would have been motivated to make such a modification for creating a small focused inspection area (col. 1, lines 28-36) as shown by Ferrandino et al., which would reduce x-ray exposure and subsequent damage to the rest of the object.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to include the apparatus of Wang as modified above with the working

distance of several centimeters, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. One would have been motivated to make such a modification for more easily focusing the electron beam of Wang (fig. 2, #9) without requiring as much energy (fig. 2, for #11) to cause such focusing.

Note that recitations (i.e., "said pin hole is scanned in order to specify a region and positional identification of said object to do an elemental analysis and take a perspective image corresponding to said object by said X-rays passing through said pin hole") with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from prior art if the prior art teaches all the structural limitations of the claim. See MPEP 2114.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, Delong et al., Saito et al., and Ferrandino et al. as applied to claim 5 above, and further in view of Satoh (US 2002/0097834).

Wang as modified above suggests an apparatus as recited above.

However, Wang fails to disclose wherein a detecting portion comprises a cadmium telluride semiconductor.

Satoh teaches wherein a detecting portion necessarily comprises a cadmium telluride semiconductor (paragraph 10).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to include the apparatus of Wang as modified above with the cadmium

telluride of Satoh, since one would have been motivated to make such a modification for higher efficiency (paragraph 10) as implied from Satoh.

Allowable Subject Matter

8. Claim 6 would be allowable if amended to overcome the claim objections(s) set forth in this Office action. The following is a statement of reasons for the indication of allowable subject matter.

Regarding claim 6, prior art fails to disclose or fairly suggest an X-ray microscopic inspection apparatus, including a target comprising a plurality of target elements, reflected electron detecting means for detecting a reflected electron from said target, electron image generating means for performing imaging of a target surface of a target for X-ray generation utilizing signals from said reflected electron detecting means, and a target selecting means for selecting a target element by swinging said electron probe to a position of an appropriate target element by controlling a current of a scan coil, so that a characteristic X-ray having an appropriate wavelength is generated according to an inspecting purpose, and wherein said target selecting means has a function of selecting a target element within a plurality of target elements by a user's selecting operation according to an electron image of said target surface, in combination with all the limitations in the claim.

Response to Arguments

9. Applicant's arguments with respect to claims 1-5 and 11 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

gk

EDWARD J. GLICK
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